

1/4 082 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--COSMONAUTICS: PAST AND FUTURE, COMMENTARY ON SOVIET SPACE PROGRAM
-U-
AUTHOR--PETROV, B.N. *P*
COUNTRY OF INFO--USSR, FRANCE, CZECHOSLOVAKIA, EAST GERMANY
SOURCE--MOSCOW, AVIATSIYA I KOSMONAVTIKA, NO 5, 1970, PP 36-38
DATE PUBLISHED-----70

SUBJECT AREAS--SPACE TECHNOLOGY, NAVIGATION, ATMOSPHERIC SCIENCES,
BIOLOGICAL AND MEDICAL SCIENCES, ASTRONOMY, ASTROPHYSICS
TOPIC TAGS--SPACE PROGRAM, INTERPLANETARY SPACE STATION, FOREIGN TECHNICAL
RELATION, SPACE COMMUNICATION, METEOROLOGY, SPACE MEDICINE, SPACE
BIOLOGY, ARTIFICIAL EARTH SATELLITE, MANNED ORBITAL LABORATORY, UNMANNED
ORBITAL LABORATORY, ASTRONOMIC OBSERVATORY/(U)INTERCOSMOS 2 SATELLITE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
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STEP NO--US/0209/70/000/005/0036/0038

CIRC ACCESSION NO--AP0126601

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PROCESSING DATE--23OCT70

2/4 082

CIRC ACCESSION NO--AP0126601

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. IN AN INTERVIEW WITH ACADEMICIAN BORIS NIKOLAYEVICH PETROV SOME OF THE QUESTIONS AND ANSWERS WERE AS FOLLOWS: Q. WHAT ARE THE PRINCIPAL DIRECTIONS IN SPACE RESEARCH IN OUR COUNTRY? A. IN ADDITION TO FLIGHTS OF SPACE VEHICLES IN CIRCUMTERRESTRIAL SPACE, THE SOVIET SPACE PROGRAM EMPHASIZES STUDY OF THE MOON AND PLANETS, AS WELL AS INTERPLANETARY SPACE. THIS STUDY IS MADE WITH AUTOMATIC INTERPLANETARY STATIONS. THE PARTICIPATION OF MAN IN FUTURE SCIENTIFIC INVESTIGATIONS OF DISTANT SPACE, THE MOON AND PLANETS IS NOT PRECLUDED. HOWEVER, AT THE PRESENT TIME THE EMPHASIS IN THESE INVESTIGATIONS IS ON AUTOMATIC VEHICLES. THEY ARE CONSIDERABLY CHEAPER THAN MANNED VEHICLES AND ARE CAPABLE OF TRANSMITTING OR RETURNING TO THE EARTH VALUABLE SCIENTIFIC INFORMATION FROM REGIONS NEVER VISITED BY MAN. Q. WHAT IS THE STATUS OF USSR SPACE COOPERATION WITH OTHER COUNTRIES? A. SOVIET SCIENTISTS ARE CONDUCTING JOINT WORK IN THE FIELDS OF SPACE PHYSICS, SPACE COMMUNICATIONS, METEOROLOGY, AERONOMY, SPACE MEDICINE AND BIOLOGY WITH THE SOCIALIST COUNTRIES, FRANCE AND SOME OTHERS. THE MOST IMPORTANT RESULT HAS BEEN THE LAUNCHING OF THE "INTERKOSMOS" SATELLITES. THE INSTRUMENTATION FOR THESE SATELLITES WAS DEVELOPED BY SCIENTISTS IN THE USSR, GDR AND CZSSR. ALSO PARTICIPATING WERE ASTRONOMICAL, GEOPHYSICAL AND RADIOASTRONOMICAL OBSERVATORIES IN BULGARIA, HUNGARY, GDR, POLAND, ROMANIA, USSR AND CZECHOSLOVAKIA. THIS HAS YIELDED IMPORTANT INFORMATION ON SHORT WAVE, UV AND X RADIATION FROM THE SUN AND ITS EFFECT ON THE UPPER ATMOSPHERE AND IONOSPHERE.

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ABSTRACT/EXTRACT--THE "INTERKOSMOS 2" WAS USED IN INVESTIGATING CHARACTERISTICS OF THE IONOSPHERE, EXERTING A SUBSTANTIAL EFFECT ON RADIO WAVE PROPAGATION. THE USSR AND FRANCE ARE MAKING JOINT INVESTIGATIONS OF THE GEOMAGNETIC FIELD AND BEHAVIOR OF THE IONOSPHERE AT MAGNETICALLY CONJUGATE POINTS. JOINT ROCKET METEOROLOGICAL INVESTIGATIONS ARE BEING MADE AT A FRENCH POLYGON IN THE LANDES AND ON KHEYS ISLAND. JOINT EXPERIMENTS ARE BEING MADE USING THE "MOLNIYA 1" ARTIFICIAL SATELLITES. THE FUTURE PROGRAM CALLS FOR LAUNCHING OF OTHER SPACE VEHICLES CREATED BY SCIENTISTS IN DIFFERENT COUNTRIES. Q. WHAT WILL BE THE EFFECT ON SCIENCE FROM THE CREATION OF ORBITAL STATIONS? A. SCIENTISTS EXPECT MUCH FROM LONG LIVED ORBITAL STATIONS AND LABORATORIES. THEY WILL AFFORD NEW POSSIBILITIES IN THE DEVELOPMENT OF GEOPHYSICS, ASTROPHYSICS, ASTRONOMY, MEDICINE, BIOLOGY AND SPACE TECHNOLOGY. ORBITAL STATIONS WILL BE EXTREMELY VALUABLE FOR THE NATIONAL ECONOMY, STUDY OF THE NATURAL RESOURCES OF OUR PLANET. THEY WILL BE OF ENORMOUS ASSISTANCE TO SCIENTISTS IN THE QUEST FOR MINERALS AND THE DEVELOPMENT OF AGRICULTURE, FORESTRY AND WATER MANAGEMENT, AS WELL AS STUDIES OF THE OCEAN. ORBITAL STATIONS WILL RESULT IN A NEW ERA OF ADVANCEMENT IN COSMONAUTICS. THEY CAN BE USED AS COSMODROMES IN SPACE, LAUNCHING PLATFORMS FOR FLIGHTS TO OTHER PLANETS. THEY WILL BE USED IN PERFECTING SHIP SYSTEMS AND TRAINING COSMONAUTS PRIOR TO DISTANT SPACE FLIGHTS. COSMONAUTS CAN BE ACCLIMATIZED AT SUCH STATIONS AND CAN PARTICIPATE IN THE ASSEMBLY AND TESTING OF INTERPLANETARY SHIPS.

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ABSTRACT/EXTRACT--ORBITAL STATIONS WILL BE USED IN MAINTAINING COMMUNICATIONS WITH INTERPLANETARY VEHICLES OVER VERY GREAT DISTANCES. IN CONTRAST TO SPACE COMMUNICATION STATIONS ON EARTH, THERE WILL BE NO RADIO INTERFERENCE, WIND OR OTHER NATURAL PHENOMENA HINDERING THE OPERATION OF GROUND STATIONS. IT WILL BE POSSIBLE TO USE LASERS FOR DISTANT SPACE STATIONS, AN IMPOSSIBILITY FOR GROUND STATIONS DUE TO SCATTERING OF COHERENT RADIATION OF THE LASER BEAM IN THE EARTH'S ATMOSPHERE. Q. WHAT DO YOU SEE AS THE FUTURE DIRECTION IN COSMONAUTICS? A. ONE OF THESE DIRECTIONS IS THE CREATION OF ORBITAL STATIONS. THE USSR IS EMPHASIZING THIS DIRECTION BECAUSE THEY WILL YIELD THE GREATEST RETURN FROM ANY POSSIBLE INPUT OF EFFORT. LUNAR INVESTIGATIONS WILL BE CONTINUED, USING BOTH MANNED AND AUTOMATIC VEHICLES. AS BEFORE, IMPORTANT DIRECTIONS IN COSMONAUTICS WILL BE THE LAUNCHING OF AUTOMATIC VEHICLES FOR INVESTIGATING CIRCUMTERRESTRIAL SPACE AND PLANETS OF THE SOLAR SYSTEM. THERE IS NEED FOR CREATING AN ASTROPHYSICAL OBSERVATORY AT A CONSIDERABLE DISTANCE FROM THE EARTH. SPECIALIZED SPACE VEHICLES MUST BE CREATED FOR THE NEEDS OF COMMUNICATIONS, NAVIGATION AND METEOROLOGY. REGARDLESS OF THE EFFECTIVENESS OF AUTOMATIC SPACE VEHICLES, MANKIND WILL NEVER ABANDON ITS DREAMS OF MANNED FLIGHTS OF THE PLANETS.

1/4 046 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--CONQUERERS OF THE UNIVERSE, SOME ASPECTS OF SOVIET THOUGHT ON THE
SPACE PROGRAM -U-
AUTHOR--PETROV, B.N. P
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, SOVETSKIY VOIN, NO 6, MARCH 1970, PP 21-27
DATE PUBLISHED--MAR70
SUBJECT AREAS--SPACE TECHNOLOGY, ASTRONOMY, ASTROPHYSICS
TOPIC TAGS--SOLAR SYSTEM, MANNED ORBITAL LABORATORY, SPACE STATION, LUNAR
PROBE, MARS PROBE, INTERPLANETARY PROBE, AUTOMATIC SPACE STATION
CENTREL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1994/0339 STEP NO--UR/9075/70/000/006/0021/0027
CIRC ACCESSION NO--AP0114646
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PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0114646

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PROSPECTS FOR FURTHER INVESTIGATION OF SPACE AND PLANETS OF THE SOLAR SYSTEM ARE BROAD AND VARIED. SCIENTISTS ARE FORMULATING FAR MORE OBJECTIVES THAN THEY CAN CARRY OUT, EVEN IF THE JOINT EFFORTS OF ALL THE LEADING COUNTRIES OF THE WORLD WERE EMPLOYED. DURING THE NEXT FEW YEARS STUDIES OF CIRCUMTERRESTRIAL SPACE, THE UPPER ATMOSPHERE AND EARTH FROM SPACE WILL UNDOUBTEDLY DEVELOP FURTHER WITH THE USE OF SATELLITES WITH AUTOMATIC INSTRUMENTATION, PERIODICALLY LAUNCHED MANNED SPACESHIPS AND LARGE ORBITING SCIENTIFIC STATIONS OPERATING FOR LONG PERIODS AND HAVING A REPLACEABLE CREW, AS WELL AS BY SOUNDING THE ATMOSPHERE WITH GEOPHYSICAL ROCKETS. IT IS OF GREAT IMPORTANCE TO COMBINE THESE INVESTIGATIONS WITH GROUND OBSERVATIONS AND COMPLEX SIMULTANEOUS EXPERIMENTS UNDER UNIFIED PROGRAMS. INVESTIGATIONS OF THE MOON WILL OBVIOUSLY BE CONTINUED BY BOTH AUTOMATIC VEHICLES AND MANNED SHIPS. THE ANCIENT DREAM OF SCIENTISTS OF CREATING AN ASTRONOMICAL OBSERVATORY AND SCIENTIFIC BASE ON THE MOON WILL BECOME A REALITY IN THE NOT TOO DISTANT FUTURE. STUDY OF PLANETS OF THE SOLAR SYSTEM PLAYS AN IMPORTANT ROLE IN SPACE RESEARCH: THERE WILL BE FURTHER STUDY OF THE VENUSIAN ATMOSPHERE BY AUTOMATIC PROBES AND DETERMINATION OF THE INTERNAL STRUCTURE, NATURE AND RELIEF OF THE SURFACE OF THAT MYSTERIOUS PLANET. IT IS OF CONSIDERABLE INTEREST TO STUDY MARS, THE NATURE OF ITS POLAR CAPS, ATMOSPHERE AND THE STRUCTURE OF THE SURFACE OF THAT PLANET. SOONER OR LATER MAN WILL UNDOUBTEDLY WALK ON THE MARTIAN SURFACE. HOWEVER, MANY HIGHLY IMPORTANT SCIENTIFIC DATA ARE BEING OBTAINED EVEN NOW BY AUTOMATIC VEHICLES.

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ABSTRACT/EXTRACT--IT IS BECOMING ENTIRELY REALISTIC TO SEND AUTOMATIC PROBES TO MERCURY AND JUPITER AND THEN TO SATURN AND NEPTUNE. HOWEVER, THIS PROBLEM IMPOSES MANY NEW REQUIREMENTS ON THE VEHICLE AND SCIENTIFIC INSTRUMENTS AND MOST IMPORTANTLY, THERE IS NEED FOR GREAT POWER RESERVES AND A VERY HIGH RELIABILITY OF ALL SPACE VEHICLE SYSTEMS. IT SHOULD ALSO BE NOTED THAT A GREAT POWER SUPPLY IS REQUIRED FOR THESE PURPOSES.

MANY SCIENTIFICALLY INTERESTING PROBLEMS ARE INVOLVED IN STUDY OF INTERPLANETARY SPACE, THE SOLAR WIND, COSMIC RAYS AND EXPERIMENTAL CHECKING OF THE THEORY OF RELATIVITY. THESE TASKS WILL UNDOUBTEDLY REQUIRE NEW VEHICLES, APPARATUS AND INSTRUMENTATION. AS A RESULT OF IMPLEMENTATION OF THE SPACE RESEARCH PROGRAM SCIENCE WILL UNDERGO FURTHER VIGOROUS DEVELOPMENT AND WILL BE ENRICHED BY NEW DISCOVERIES. MANY PROBLEMS IN THE STUDY OF SPACE REQUIRE COMPLEX INVESTIGATIONS, COMBINATIONS OF MEASUREMENTS MADE WITH SCIENTIFIC INSTRUMENTS SET UP ABOARD SATELLITES, AUTOMATIC INTERPLANETARY PROBES OR SPACESHIPS, COMBINED WITH OBSERVATIONS AND EXPERIMENTS MADE BY SURFACE INSTRUMENTS IN DIFFERENT REGIONS OF THE GLOBE. IT IS OF PARTICULAR IMPORTANCE TO ORGANIZE INTERNATIONAL COOPERATION FOR SOLVING SUCH PROBLEMS. ON THE OTHER HAND, THE BREADTH AND VARIETY OF PROBLEMS INVOLVED IN SPACE STUDY ARE BEYOND THE CAPACITIES OF ANY ONE COUNTRY. THE PARTICIPATION OF SCIENTISTS OF DIFFERENT COUNTRIES, DIFFERENT SCIENTIFIC SCHOOLS AND INCLINATIONS AND INTERESTS CAN BECOME EXTREMELY EFFECTIVE. PARTICIPATION IN SPACE RESEARCH WILL BRING ADVANTAGES TO EVERY COUNTRY, LARGE OR SMALL, WELL DEVELOPED OR IN THE EARLIER STAGES OF DEVELOPMENT.

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ABSTRACT/EXTRACT--IN STRIVING TO TRANSFORM SPACE INTO AN ARENA OF PEACE AND INTERNATIONAL COOPERATION OF STATES, THE SOVIET UNION IS MAINTAINING BROAD INTERNATIONAL CONTACTS IN THE FIELD OF SPACE EXPLORATION AND USE.

THE SPACE ERA HAS LED TO THE APPEARANCE OF ENTIRELY NEW FIELDS OF TECHNOLOGY AND HAS BROUGHT ABOUT THE DEVELOPMENT OF NEW DIRECTIONS IN SCIENCE. THE LENINIST ROUTE TO DEVELOPMENT OF THE NATIONAL ECONOMY, ALONG WHICH OUR COUNTRY IS TRAVELING AND THE FLOURISHING OF SCIENCE, WHICH IS RECEIVING SO MUCH ATTENTION IN OUR COUNTRY IN ACCORDANCE WITH LENIN'S LEGACY, HAVE CREATED APPROPRIATE CONDITIONS FOR THE IMPLEMENTATION OF A GREAT PROGRAM FOR SPACE RESEARCH AND SPACE EXPLOITATION. THE EVER ACCELERATING RATE OF TECHNICAL PROGRESS, WHICH IN PARTICULAR BEGAN WITH THE ONSET OF THE SPACE ERA, IS AN ASSURANCE OF THE FURTHER EFFECTIVE DEVELOPMENT OF OUR ENTIRE NATIONAL ECONOMY, THE FLOURISHING OF SCIENCE AND AN INCREASE IN THE WELFARE OF THE WORKERS, A GUARANTEE OF THE SUCCESSFUL CONSTRUCTION OF THE MATERIAL BASE OF A COMMUNISTIC SOCIETY FORESEEN IN THE SCIENTIFIC PREVISIONS OF VLADIMIR LENIN.

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1/2 061
UNCLASSIFIED
TITLE--ORBITAL STATIONS AND STUDIES OF THE EARTH FROM SPACE -U- PROCESSING DATE--27NOV70
AUTHOR--PETROV, B.N. *P*
COUNTRY OF INFO--USSR, FRANCE
SOURCE--3RD IFAC SYMPOSIUM ON SPACE CONTROL, TOULOUSE, FRANCE, MARCH 1970
DATE PUBLISHED-----70
SUBJECT AREAS--SPACE TECHNOLOGY, EARTH SCIENCES AND OCEANOGRAPHY,
ATMOSPHERIC SCIENCES
TOPIC TAGS--MANNED ORBITAL LABORATORY, UPPER ATMOSPHERE, SPACEBORNE EARTH
OBSERVATION, SPACEBORNE ATMOSPHERIC OBSERVATION, SPACE STATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
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CIRC ACCESSION NO--AT0139065
UNCLASSIFIED

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PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0139065

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ADVANCES IN SPACE EXPLORATION HAVE OPENED A NEW ERA IN THE PROGRESS OF SCIENCE AND ARE A POWERFUL IMPETUS TO TECHNOLOGICAL DEVELOPMENTS. NEW DISCOVERIES HAVE BEEN MADE IN PHYSICS AND COSMOLOGY, GEOPHYSICS AND BIOLOGY. QUITE NEW BRANCHES OF SCIENCE HAVE EMERGED SUCH AS SPACE METEOROLOGY AND AERONOMY, SPACE ASTRONOMY, SPACE BIOLOGY AND MEDICINE. NOW THE EARTH RESOURCES, THE WORLD OCEAN, THE UPPER ATMOSPHERE, WEATHER AND HYDROLOGICAL PROCESSES CAN BE STUDIED FROM SPACE; ASTROPHYSICAL AND RADIOASTRONOMICAL PHENOMENA CAN BE OBSERVED WITHOUT THE INTERFERENCE OF THE ATMOSPHERE. DURING THE 12 YEARS OF SPACE AGE THE AUTOMATIC DEVICES SUCH AS ARTIFICIAL SATELLITES, AUTOMATIC INTERPLANETARY STATIONS AND PROBES AND RELATIVELY SHORT MANNED FLIGHTS HAVE GIVEN US TREMENDOUS EXPERIMENTAL EVIDENCE THAT EXPANDS OUR KNOWLEDGE OF THE EARTH, THE MOON, THE NEAREST PLANETS AND SPACE. LONG STANDING ORBITAL STATIONS WITH PERIODICALLY RELIEVED CREW ARE STILL MORE PROMISING.

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USSR

UDC 62.501.12

PETROV, B. N., Academician, BODNER, V. A., and ALEKSEYEV, K. B.

"Analytical Solution of the Problem of the Control of a Spatial Turning Maneuver"

Moscow, Doklady Akademii Nauk SSSR, Vol 192, No 6, 21 Jun 70, pp 1235-1238

Abstract: Control of the orientation of flying objects by means of a single rotation around a certain axis is said to exhibit the best potential possibilities as compared with the three consecutive turns relative to orthogonal axes connected with the object, as are ordinarily used. An analytical solution is given for the problem of the synthesis of an algorithm for orientation control. The principle of extensive control is applied: this consists of selecting a vector of the controlling moment of limited magnitude $M = \|M_1, M_2, M_3\|^T$ with the condition of motion of the object relative to a given axis acted upon by components of the moment M_i with respect to the connected axes of the object. Expressions are given for the moment with respect to the axes of the object that provide rotation in minimum time about a certain axis e_0 and for the work expended on control. It is noted that this algorithm for optimal extensive control requires an onboard computer to determine the direction of the axis of rotation, and 1/2

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PETROV, B. N., et al., Doklady Akademii Nauk SSSR, Vol 192, No 6, 21 Jun 70, pp 1235-1238

the magnitude and sign of the resulting angle of rotation and to form the controlling moments about the connected axes. One can then provide either the minimum time for the turning maneuver or the minimum expenditure of work in a given time.

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PETROV, B. N.

Spacecraft
System

3 Percent
Systems

50: JPRS 56134
31 MAY 1972

62101A

EVALUATING THE PRECISION OF SPACECRAFT CONTROL SYSTEMS

Article by B. N. Petrov, B. Ya. Andriyenko, Yu. P. Poronov-Soloviy, Moscow, U.S.S.R. Automatic Control Systems, 1971, pp 121-126

The automatic control systems of spacecraft and their power plants are, as a rule, complex nonlinear systems. They are subject to the action of many external and parametric perturbations applied to various inputs. The solution of systems requires the use of statistical methods. At a rule the use of statistical methods in engineering calculations requires a large volume of statistical synthesis, in determining the sensitivity of systems to change in their parameters, it becomes necessary to resort to repeated calculations of statistical precision, which increases the already enormous laboriousness of the calculations.

Rigorous solution of the problem of statistical analysis of systems, with the exception of those that reduce to linear systems [1], is possible only in special cases.

Thus, for instance, the problem of analyzing a class of systems described by ordinary differential equations in the assumption that perturbations are white noise transformed in filters is discussed in [2], because of the extremely large volume of calculations.

Many works have been published on approximate methods of evaluating the statistical precision of nonlinear control systems. The bibliography of these works is widely known. Of these works we cite [3, 4].

A large volume of work has been done on methods of statistical linearization [5, 6], and in many cases this method is convenient in engineering. For systems described by high-order equations with a large number of nonlinearities the unavailability of the equations derived by statistical linearization method increases sharply, and this diminishes their practical value.

PETROV, B.N.

Power + Energetic Plants

These of the report "Some Aspects of Controlling Plants with Distributed Parameters (Energetic and Power Plants) and Possible Ways of Realization presented to the International Symposium IPAC (Genoa, Italy) on automatic control in space.

B.N. Petrov, G.M. Ulanov, A.A. Oshevalov, R.V. Yakovleva.

Some specific features of controlling energetic plants as distributed plants are considered. The analysis of the plant as a multidimensional multicircuit control object and that of its separate circuits (flow charts) have been made. Some problems appearing in designing and developing power and energetic plant control systems are considered. Some ways of solving these problems have been outlined. A new method of approach to designing the above plants consisting of distributed elements or objects is given. The principle of "building" of plant thermal flow charts has been formulated. The criterion of "dynamic distribution" is given. The flow chart solution has been demonstrated and the plant dynamics has been estimated. The main principle of control system (construction) building is proposed as well as the ways of engineering realization. The use of principle of invariance for distributed plant control has been shown. The singula principle of optimal control has been developed. The algorithm of plant control have been obtained.

SECRET

USSR

UDC 629.78.062.2

PETROV, B. N., and RAUCHENBAKH, B. V.

"Soviet Work on Automatic Control in Outer Space"

Moscow, Tr. II Mezhdunar. Simpoz. IFAK po Avtomat. Upr. v Mirn. Ispol'z. Kosmich. Prostranstva. Upr. Kosmich. Apparata i Korablyami (Works of the Second International Symposium of the International Federation of Automatic Control on Automatic Control for the Peaceful Use of Cosmic Space. Control of Space Vehicles and Space Ships), 1971, pp 11-18 (from Referativnyy Zhurnal, Raketostroyeniye, No 12, Dec 71, Abstract No 12.41,29)

Translation: The article deals with the principal results, in the USSR, of the theory and practice of the automatic control of space vehicles during the ten years that have elapsed after launching of the first Soviet artificial earth satellite.

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USSR

UDC: 629.78.062.2

PETROV, B. N., KOLPAKOVA, N. P., VASIL'YEV, V. A., PAVLENKO, A. I.

"Some Problems in Synthesis of Designs for Systems of Automatic Control of Three-Dimensional Motion of an Orbital Aircraft in the Earth's Atmosphere"

Moscow, Upr. dvizhushchimisya ob'yektami. Tr. IV Vses. soveshch. po avtomat. upr. Tbilisi, 1968--sbornik (Control of Moving Objects. Works of the Fourth All-Union Conference on Automatic Control. Tbilisi, 1968--collection of papers), 1972, pp 224-242 (from RZh-Raketostroyeniye, No 10, Oct 72, abstract No 10.41.160)

Translation: Flight conditions of an orbital aircraft at hypersonic speeds require accounting for the mutual influence of longitudinal and lateral motion even at comparatively low angles of attack and glids. In this connection it is of interest to investigate a set of designs of control systems for orbital aircraft in the class of related multichannel systems ensuring independence or slight dependence of control channels or groups of channels. The paper formulates the problem of deriving an entire set of designs and selecting the best automatic control system both in the sense of process quality and simplicity of realization. Graphs without loops are taken as

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PETROV, B. N. et al., Upr. dvizhushchimisya ob'yektami. Tr. IV Vses. soveshch. po avtomat. upr. Tbilisi, 1968---sbornik, 1972, pp 224-242

the basis for design representation of orbital aircraft control systems, which to a considerable extent facilitates the investigation of internal connections of the coordinates in the object, enables selection of control elements from the condition of their maximum effectiveness in the control process, and also enables determination of a set of designs of selectively invariant systems. This simplifies approach to analysis of the system as a whole. Nine illustrations bibliography of five titles. Résumé.

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USSR

UDC 669.046.5

UDC 669.046.5

PETROV, B. S., VISHKAREV, A. F., TYURIN, Ye. I., DANILIN, V.I.,
SELIVANOV, V. M., and YAVOYSKIY, V. I.

"Degree of Oxidation of Stainless Steels With Oxygen Blowing"

Moscow, V sb. "Sovremennyye problemy kachestva stali" (MISI) (Collection of Works. Modern Problems of Steel Quality) (Moscow Institute of Steel and Alloys), Izd-vo "Metallurgiya," No 61, 1970, pp 196-198

Abstract: Results are presented of a study on the degree of bath oxidation with oxygen blowing during decarburization at less than 0.20% C content (nickel-free steels with 6-8 and 14-16% Cr and steels with 14-16% Cr, and 11 and 30% Ni). It is established that the degree of metal oxidation depends strictly on carbon concentration, although the oxidation level is determined by the initial Cr and Ni concentrations. 1 figure, 2 references.

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USSR

UDC 576.858.23(Coxsackie)095.38:599.323.4

KISELEVA, N. V., PETROV, B. V., and BERDYLYEV, O. M., Ashkhabad Scientific Research Institute of Epidemiology and Hygiene

"Isolation of Coxsackie A Viruses From the Intestine of the House Mouse"

Moscow, Voprosy Virusologii, No 6, 1972, pp 713-716

Abstract: Intestinal suspensions from 90 *Mus musculus* Severtzovi Kaschkar were tested virologically to determine their part in hepatitis foci of the Turkmen SSR. Isolated agent had cytopathic effects on human embryo kidney cells and human fibroblasts, manifested titers of 10^5 - 10^6 TCID₅₀ with respect to cytopathic activity, were stable in response to ether and chloroform, and were nonagglutinating. Three of four strains isolated, could be neutralized by Coxsackie A9 antiserum. Suckling mice infected with the agent displayed disease symptoms by the 3d day. Pathology was most pronounced in skeletal musculature. Histological findings for these mice and two adult mice not infected experimentally but ones which had come in contact with the former and contracted the disease are described in detail. Complement-fixing antibodies against Coxsackie A₂, A₃, A₄, A₅, A₆, A₇, A₉, and A₁₈ viruses were detected in blood serums of 129 mice. One sample contained antibodies to several Coxsackie A viruses. Investigation of the pathogens is continuing.

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USSR

UDC 621.374.4

PETROV, B. Ye.

"Frequency Multiplication Using P-N Junctions in a Partial Triggering Mode"

Poluprovodnikovyye Pribory v Tekhnike Elektrosvyazi (Semiconductor Instruments
in Electrical Communication Technology), Moscow, "Svyaz'," No 7, 1971, pp
52-70

Abstract: As a result of analyzing the power losses in the varactor and the power generated at the drift source due to the recombination effect, the author obtains expressions for computing the efficiency of the varactor, the power in the load, the input power without allowing for the recombination effect, the power of excitation allowing for the recombination, and expressions for the optimal values of the autodrift resistance and the drift voltage. To determine these values the author makes use of the following varactor parameters: the averaged capacitance of the trapped p-n junction, the maximum instantaneous voltage on the varactor, the averaged resistances of the semiconductor material and the contacts of the varactor, respectively, in the closed and the open states of the p-n junction, the parameters which characterize the rate of recovery of the closed state of the p-n junction when it emerges from the state of direct conductivity, and the effective

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PETROV, B. Ye., Poluprovodnikovyye Pribory v Tekhnike Elektrosvyazi
(Semiconductor Instruments in Electrical Communication Technology), Moscow,
"Svyaz'," No 7, 1971, pp 52-70

recombination time of the minority carriers in the semiconductor material. All the relationships found were obtained for the regime of strong triggering of the p-n junction, the regime of weak triggering of the p-n junction, and the regime of zero charge shift. Selection of one of these three regimes for a specific varactor, frequency of excitation, and multiplication must be made by using the relationships obtained only after comparing these regimes with respect to their energy indices. The article contains 6 figures and 11 bibliographic entries.

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USSR

UDC: 621.374.4

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PETROV, B. Ye.

"Frequency Multiplication Using PN-Junctions in the Frequency Triggering Mode.
Part 1"

V sb. Poluprovodn. pribory v tekhn. elektrosvyazi (Semiconductor Devices in Electrical Communications Technology--collection of works), Vyp. 5, Moscow, "Svyaz'", 1970, pp 197-215 (from RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7D26)

Translation: An analysis is given of the energy indices of varactor frequency multipliers with resonance input and output circuits. The frequency triggering mode of the PN junction is considered. It is shown that there are several possible states which correspond to the "conditions of optimality" satisfying the condition of maximum efficiency of the filtering circuits. Bibliography of 30 titles.
Resumé.

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USSR

UDC 621.378.329

BOGDANKOVICH, O. V., KOROLEV, S. V., NASEDKIN, A. A., OLKHNOV, I. K.,
PETROV, D. N.

"Use of a Microwave-Modulated Electron Beam for Semiconductor Laser Pumping"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 4, "Sovetskoye Radio",
1971, pp 97-99

Abstract: SHF modulation of semiconductor laser emission is achieved by using a microwave-modulated electron beam for laser pumping. A mode of emission is obtained in which multiple division of the pulse repetition frequency with respect to the frequency of the modulating SHF signal is attained. The authors thank V. A. Dorofeyev and G. N. Yamonis for assistance with the work. Three figures, bibliography of six titles.

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1/2 034 UNCLASSIFIED PROCESSING DATE--02OCT70
TITLE--ON THE DEFORMATION PROPERTIES OF A QUASIDILATANT DISPERS SYSTEM AT
LOW SHEAR STRESSES -U-
AUTHOR--(05)-STALNOV, A.K., KRASHENINNIKOV, A.I., DEMICHEV, V.V., PETROV,
E.A., STUPEN, L.V.
COUNTRY OF INFO--USSR
SOURCE--KOLLOIDNYY ZHURNAL, 1970, VOL 32, NR 2, PP 308-309
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY, MATERIALS
TOPIC TAGS--CHEMICAL SUSPENSION, COPOLYMER, ACRYLONITRILE, ACRYLATE, SHEAR
STRESS, MATERIAL DEFORMATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1992/1548 STEP NO--UR/0069/70/032/002/0308/0309
CIRC ACCESSION NO--AP0112542
UNCLASSIFIED

2/2 034

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0112542

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DEFORMATION OF SUSPENSIONS OF A COPOLYMER OF ACRYLONITRILE WITH METHYLACRYLATE IN 2-NITROPROPANOL, 1 AT LOW SHEAR STRESSES INVOLVES THE FORMATION IN THE SYSTEM OF A STRUCTURE THE STRENGTH OF WHICH IS GREATER THAN THE SHEAR STRESS APPLIED. UNDER ISOTHERMAL CONDITIONS THE STRENGTH OF THE STRUCTURE FORMED DIMINISHES WITH TIME AFTER THE LOAD IS REMOVED.

UNCLASSIFIED

1/2 012
UNCLASSIFIED
TITLE--EQUILIBRIUM AND KINETIC ACIDITY OF P CARBORANE -U- PROCESSING DATE--30OCT70
AUTHOR--(05)--PETROV, E.A., YAKOVLEVA, YE.A., ISAYEVA, G.G., KALININ, V.N.,
ZAKHARKIN, L.I.
COUNTRY OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(3), 617-19 (CHEM)
DATE PUBLISHED--70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--CARBORANE, ISOMER, ISOTOPE EXCHANGE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--2000/0694
STEP NO--UR/0020/70/191/003/0617/0619
CIRC ACCESSION NO--AT0124366
UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0124366

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FROM METALATION EX PTS. WITH P CARBORANE IN (CH SUB2 OME) SUB2 AND CYCLO,C SUB6 H SUB11 NH SUB2 THE FOLLOWING PKA OF ISOMERIC CARBORANES WERE D4DUCED: O 233.3, M 27.9, P 30.0; FROM REACTIONS OF ISOTOPIC H EXCHANGE IN LIQ. NH SUB3 THESE WERE 19.2, 27, 29.4. THE RATE FOR THE P ISOMER HAD THE RATE CONST. K 4.2 TIMES 10 PRIME NEGATIVE6 SEC PRIME NEGATIVE1 AT 120DEGREES, AND 8.5 TIMES 10 PRIME NEGATIVE7 SEC PRIME NEGATIVE1 AT 50DEGREES. FACILITY: FIZ. KHIM. INST. IM. KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC [537.226+537.311.33]:538

PETROV, E. G.

"Peculiarities of Pair Light Absorption by Antiferrodielectrics Associated With Magnetic Ion Spin Value"

Osobennosti parnogo pogloshcheniya sveta antiferrodielektrikami, svyazannyye s velichinoy spina magnitnogo iona (cf. English above. Academy of Sciences Ukrainian SSR, Institute of Theoretical Physics, Preprint-71-68R), Kiev, 1971, 48 pp, 12 k. (from RZh-Fizika, No 2, Feb 72, Abstract No 2YE1504)

Translation: The author carries out the successive expansion of the Hamiltonian of spin and electronic excitations of an antiferrodielectric with allowance for the interaction of excitations with each other. It is shown that the number of expansion terms is substantially related to the spin value of the magnetic ion in its ground state. An example of pair two-exciton absorption is used to show the role of the interaction of excitations with each other. Consideration is given to the case of a noncollinear antiferrodielectric.

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- 3 -

USSR

UDC 621.3.049.63

PETROV, E. M., KHRYCHEV, L. I., FILIPPOV, V. Ye., LUFANOV, V. Ye., ZABORSKIY, V. N., ISAYEV, V. S.

"A Device for Attaching Wire Leads to the Contact Areas of Integrated Circuits"

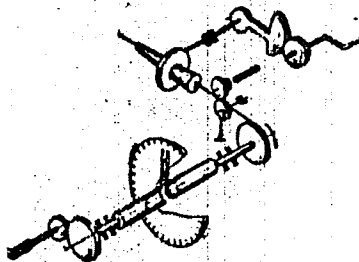
Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 7, Mar 71, Author's Certificate No 295217, Division H, filed 21 Apr 69, published 4 Feb 71, p 172

Translation: This Author's Certificate introduces a device for attaching wire leads to the contact areas of integrated circuits. The device contains a drum on which a wire is wound, drive rolls, a guide capillary and a unit for checking the strength of the joint between the leads and the contact areas. As a distinguishing feature of the patent, the precision of measuring this joint strength is improved by fastening the drum on one end of a torsion spring carrying an angle-of-turn indicator, the other end of this spring being connected to the drive mechanism.

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USSR

PETROV, E. M., et al., Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 7, Mar 71, Author's Certificate No 295217, Division H, filed 21 Apr 69, published 4 Feb 71, p 172



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USSR

UDC: 621.396.6-181.5

RESHETNIKOV, N. V., PETROV, E. N.

"Statistical Approach to Intensification of Microcircuit Assembly"

Sb. nauchn. tr. po probl. mikroelektron. Mosk. in-t elektron. tekhn. (Collected Scientific Works on Problems of Microelectronics. Moscow Institute of Electronic Technology), 1970, vyp. 5, pp 212-217 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6V220)

Translation: Investigations are made of the working capacity of micro-circuit assembly workers with respect to production and physiological indices with subsequent analysis. Two phases of variation in working capacity are observed: an improvement in working capacity in the first hour of work, and deterioration from the third hour on. Measures are proposed for maintaining a high level of working capacity. Resumé.

1/1

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USSR

UDC 547.241

PETROV, E. S., TSVETKOV, Ye. N., KARACHNIK, M. I. and SHATENSHTEYN, A. I.,
Institute of Physical Chemistry imeni L. Ya. Karpov and Institute of Elemento-
Organic Compounds, Academy of Science SSSR

"Equilibrium CH-Acidity of Some Phosphine Oxides"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 5, May 1971, p 1172

Abstract: In studying the equilibrium CH-acidity of organophosphorus compounds, spectrophotometry was used to determine the equilibrium constants (K) at 25° for the following reactions conducted in diethylene glycol solutions: diphenylbenzylphosphine oxide (I) with fluorenyl lithium, and diphenylmethyl phosphine oxide (II) and phenyldimethyl phosphine oxide (III) with triphenylmethyl lithium. The pK_a was calculated from this data.

	K	pK_a
$(C_6H_5)_2P(O)CH_2C_6H_5$ (I)	2.1 ± 0.3 (7)	22.5
$(C_6H_5)_2P(O)CH_3$ (II)	14 ± 10 (8)	31.3
$C_6H_5P(O)(CH_3)_2$ (III)	6 ± 0.6 (4)	31.7

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- 58 -

USSR

PETROV, E. S., et al., Zhurnal Obshchey Khimii, Vol 41, No 5, May 1971, p 1172

A comparison of the acidities (I and II) with those of toluene and methane shows that the acidifying effect of the diphenyl phosphinoxy group is 9-10 pK_a units. A comparison of II and III shows that a substituent on the phosphorus atom (CH_3- and C_6H_5-), has little effect.

2/2

AP 9053074

UR 0289

PRIMARY SOURCE: Izvestiya Sibirskogo Otdeleniya, AN SSSR,
Seriya Khimicheskikh Nauk, Nr 12(162), Nr 5,
PP 52-57

V. N. Kuliukin, E. S. Petrov

TENSIMETRIC STUDIES
OF THE SYSTEM GALLIUM—IODINE

Vapor pressure has been determined at compositions from 100 to 3.6 atomic per-
cent of iodine in the Gallium—Iodine system with a statical method using a glass
gauge of spoon type.

The lines of liquidus were obtained in the interval of compositions between iodine
and gallium triiodide, and these appeared in a good accord with the DTA-data. Bounda-
ry of exfoliation was determined in the region of compositions between gallium triiodide
and gallium.

aa

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1949

1830

18

AP 9053062

UR 0289

PRIMARY SOURCE: Izvestiya Sibirskogo Otdeleniya, AN SSSR,
Seriya Khimicheskikh Nauk, Nr 12(162), Nr 5,
pp 47-52

N. Ya. Fvodorov, ~~E. S. Petrov~~

THE PHASE DIAGRAMS
OF THE ScBr_3 -NaBr and ScBr_3 -KBr SYSTEMS

The phase diagrams of binary systems formed by scandium bromide with sodium bromide and potassium bromide have been studied by differential thermal and X-Ray phase analysis. Compound Na_3ScBr_6 with peritectic point at 515° , compound K_3ScBr_6 congruently melting at 697° and incongruently melting compound $\text{K}_5\text{Sc}_2\text{Br}_9$ with peritectic point at 525° are formed in these systems. The compound K_3ScBr_6 enters polymorphic rearrangement at 440° .

1949 1818

USSR

UDC 669.71.472(088.3)

PETROV, E. V.

"Method of Utilization of Spent Carbon Aluminum Electrolyzer Lining"

USSR Author's Certificate No. 269495, Filed 15/10/68, Published 17/07/70,
(Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract
No. 1 G142 P)

Translation: Ground liner is first heated at 1300° for 20 minutes to
melt out the electrolyte, then the temperature is increased to 2200-2500°,
held for 0.5-1.0 hr and the fluoride salt vapors are trapped and condensed
in order to produce high purity fluoride salts and utilize the C-material
for preparation of bottoms.

1/1

USSR

UDC 535.33/34:539.184

PETROV, E. V., and TSVETKOV, V. P., Kommunarsk Mining and Metallurgy Institute

"K-Spectrum Absorptions of Zirconium in ZrB_2 , ZrC , and ZrN Interstitial Phases"

Kiev, Metallofizika, No 40, 1972, pp 98-103

Abstract: K-spectrum absorptions were produced on an Olin spectograph by the method of Koshua. Exposures were made for the second order of reflection from the (1122) plane of a quartz crystal. The distortion function was equal to 4.5 ev. The spectra were calculated according to the close ordering theory. For estimating the varying scattering ability of the compound components, the parameter n_s was introduced. It was shown that the value of this parameter for the investigated compounds coincides with the number of weakly bonded valency electrons of the atom. 3 figures, 1 table, 8 bibliographic references.

1/1

USSR

UDC 62-50

SOLODOV, A. V., and PETROV, F. S.

Lineynnye avtomaticheskiye sistemy s peremennymi parametrami (Linear Automatic Systems With Variable Parameters), Moscow, "Nauka," 1971, 620 pp

Translation: Annotation: This monograph is devoted to an examination of the theoretical bases of investigating linear automatic control systems with time-variable parameters (linear nonstationary systems). The authors examine in considerable detail several typical classes of such systems and their characteristics (impulse transition and parametric transfer functions) as well as methods for determining these characteristics and questions concerning the travel of determinate and random signals through the systems. Considerable attention is paid to the structural transformation and modeling of the systems by solving various problems of analysis and synthesis of the control systems. The theoretical material of the book is illustrated with numerous examples and figures. To read this book it is sufficient to have mathematical preparation in an ordinary course in higher mathematics presented at the Higher Technical Schools. The book is intended for specialists working in the field of automatic control. It may also be useful for graduate students and students in the higher courses of the respective specialties. (215 illustrations, 27 tables, and 73 bibliographic entries)

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USSR

SOLODOV, A. V., and PETROV, F. S., Lineynnye avtomaticheskiye sistemy s peremennymi parametrami (Linear Automatic Systems With Variable Parameters), Moscow, "Nauka," 1971, 620 pp

Table of Contents

- Chapter 1. Linear Systems With Variable Parameters
- Chapter 2. Impulse Transition Function of a Linear System
- Chapter 3. Structural Transformations of Linear Systems With Variable Parameters
- Chapter 4. Approximation Algorithms for Seeking Impulse Transition Functions of Systems With Slowly Varying Parameters
- Chapter 5. Systems With Variable Parameters Acted on by Determinate Signals
- Chapter 6. Systems With Variable Parameters Acted on by Random Signals
- Chapter 7. Controllability, Observability, and Stability in Systems With Variable Parameters
- Chapter 8. Investigation of Nonstationary Processes in Systems With Variable Parameters Using Modeling Methods

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USSR

UDC 547.869+546.185

SIMOV, D., KIRILOV, M., KAMENOV, L., PETROV, G., Sofia University, Bulgaria

"Phosphorusorganic Derivatives of Phenothiazine and N-Alkylphenothiazine Dioxide"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 2131-2132

Abstract: Reaction of phosphorus oxychloride with phenothiazine at 160° for 10-12 hrs gave N-(dichlorophosphoryl)-phenothiazine, m.p. 145-146°. When N-(2,3-dibromoisobutyl)-phenothiazine dioxide was reacted with triethylphosphite by heating a 1:2 mixture of these reagents to 160° for 4 hrs, N-(2,3-diethylphosphonylisobutyl) phenothiazine dioxide, m.p. 149°, was obtained. Reaction of N-(2-chloro-3-iodopropyl)-phenothiazine dioxide with triethylphosphite gave only N-allylphenothiazine dioxide.

1/1

Instruments and Equipment

USSR

PETROV, G., Pravda Correspondent, Leningrad

"An Automatic Machine Aids the Physician as Well as the Researcher"

Moscow, Pravda, 6 Jul 70, p 4

Abstract: A digital analyzer and regulator of physiological functions designated TsARFF, has been developed by G. N. Il'yutkin under the guidance of Ye V. Maystrakh, Head of the Chair of General Clinical Pathology and Rector of the Leningrad Institute for Advanced Training of Physicians imeni S. M. Kirov. In 140 experiments on 46 dogs, the TsARFF performed 350 intra-arterial infusions, 100 artificial respirations, 160 cardiac stimulations, and other physiological adjustments in cardiovascular regulation. The device automatically responds to situations which require the administration of pentamin or norepinephrine, and its action is quicker and more precise than that of man. Wide use of the device in surgical clinics is recommended. Its practical features include objectivity, rapid and accurate reaction to the condition of the patient at a given instant, and scientific reliability. Although the TsARFF will not replace the anesthesiologist, it will represent a reliable aid in his work.

1/1

Acc. Nr.: AN0045493

Ref. Code: UB 9012

JPRS 52162

First Arctic Ice Reconnaissance Flight Leaves Leningrad

(Complete translation: "At the Helm -- Veterans," by G. Petrov; Moscow, Pravda, 16 February 1970, p 1)

This year's first expedition organized for aerial reconnaissance of the Arctic ice will follow a path over the Barents, Kara and Laptev Seas.

The expedition, which left Leningrad in an "IL-14" aircraft of the Polar Aviation Service, is headed by Candidate of Geographical Sciences A. Kirillov. Pilot V. Tsutsayev, an experienced polar flier, and navigator V. Akkuratov, a veteran of the Arctic sky, are piloting the aircraft.

The ice surveyors and forecasters must cover a distance of approximately 40,000 kilometers and take photographs of the ice cover. [4]

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FROM: FBIS Daily Report, Soviet Union, 6 Jan 1970, Vol III, Nr 3, pp D7-D8

UR 9012

USSR

ARCTIC AND ANTARCTIC RESEARCH OUTLINED

Moscow PRAVDA 2 Jan 70 p. 3 L

[PRAVDA correspondent G. Petrov article: "From the North to the South Pole"]

[Text] It is no easy matter to sum up the diversified undertakings of the Arctic and Antarctic Scientific Research Institute during the past year. In 1969 one section of the institute alone organized 23 expeditions to the Arctic. Their participants operated drifting scientific research stations, spread a wide network of "DARMS"--drifting automatic radiometeorological stations--and studied the ice in the Vilkitskiy Strait.

19620383

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AN0020440

Much has been done by the collective of the sea expeditions section. On the eve of the new year the scientific research ship Professor Zubov arrived at its native shores. The fall Atlantic beset its crew with storms and hurricanes. But, as employee of the section A. I. Nikandrov said, the harder the work conditions, the better for science. For it is necessary to study the ocean's character at different times of the year and under different conditions.

Approximately 50 meteorologist, oceanologists, aerologists, hydrochemists, radio-chemists, and other specialists continued research into the interaction of ocean and atmosphere. Study of this problem is expected to last several years and is far from completion. But even now, with the results of the sixth voyage to the North Atlantic, certain patterns have already been established which enable temperature conditions and the state of the ice in the Atlantic and the Arctic oceans to be forecast with greater accuracy.

19620384

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AN0020440

Many researchers greeted 1970 far from their family home. Approximately 600 Soviet people--participants in the 14th and 15th Antarctic expeditions and crew members of the scientific research ship Professor Vize and the diesel-electric ship Ob--entered the new year on the ice continent and beside its shores.

Fulfilling duties as chief of the Antarctic expeditions section, L. I. Dikrovin said:

"The work of our comrades in Antarctica is now in full swing. Change of the scientific watch is taking place. On the sixth continent it is mid-summer. The sun is in the sky throughout the day and it is possible to work at any time. It is still more convenient to drive caterpillar sleigh trains at "night": the roads are freezing. But this is in the region of Mirny, where the temperature now hovers around zero. At the Vostok station the "summer heat" has been registered--minus 35 degrees.

It is still colder for the winterers of the SP-16, SP-18, and SP-19 drifting stations. They are moving on ice-floes through the polar night between latitudes 75 and 84 degrees north at a temperature down to 40 degrees of frost. They are not simply moving but working strenuously. Every 24 hours, regardless of the weather and the calendar, they transmit data on meteorological observations eight times and from aerological observations twice, report information on oceanology and geophysics, carry out research, set up experiments, fight against cracks, clear the runways of their airdromes...

The mainland wishes the Soviet researchers of the Arctic and Antarctic new successes in the coming year.

19620385

3/3

UDC: None

USSR

BALASHOV, Ye. P., LAVRENT'YEV, B. F., PETROV, G. A., and FUZANKOV, D. V.

"Digital Computing Device"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 9, 1973, p 165, No 368606

Abstract: This device contains a magnetic storage unit with a linear selector. The digital readout lines of the latter are connected to a counting amplifier, whose outputs are, in turn, connected to an AND shift. The distinctive feature of the device is that two delay circuits are contained in each digital circuit, with the inputs of each delay joined to the output of the counting amplifier output and the AND shift output for that digit. This arrangement has the effect of simplifying the structure of the device and increasing its operating speed.

1/1

1/2 046 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--DISTRIBUTION OF PARTICLES BY SIZES IN VARIOUS REGIONS OF SPRAYER
FLAME -U-
AUTHOR-(03)-PETROV, G.D., SOKOLOV, R.N., VASILVEV, V.A.
COUNTRY OF INFO--USSR
SOURCE--INZHENERNO-FIZICHESKIY ZHURNAL, 1970, VOL 18, NR 1, PP 105-109.
DATE PUBLISHED-----70
SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, PHYSICS
TOPIC TAGS--FLAME STRUCTURE, FLAME EMISSION, PLASMA TORCH SPRAYING,
PARTICLE DISTRIBUTION, FLOW RATE, LIGHT EMISSION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3001/0702 STEP NO--UR/0170/70/018/001/0105/0109
CIRC ACCESSION NO--AP0126414
UNCLASSIFIED

2/2 046

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0126414

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FIG. 1. DISTRIBUTION OF INTENSITY OF LIGHT DISSIPATED BY SPRAYER TORCH DEPENDING ON THE ANGLE OF DISSIPATION FOR BEAMS PASSING AT VARIOUS DISTANCES FROM TORCH AXIS (A); OF DISTANCE TO TORCH AXIS FOR DIFFERENT ANGLES OF DISSIPATION (SIGMA) (N, NUMBER OF ZONE); OF DISSIPATION ANGLE FOR VARIOUS TORCH ZONES (1-8) AFTER CALCULATING BY FORMULA (1) (8). FIG. 2. SCHEME OF SEPARATION OF TORCH ZONES INTO ANNULAR REGIONS (I AND II, PLANES WHERE MEASUREMENTS WERE CARRIED OUT. L, DISTANCE FROM NOZZLE CUT TO PLANE UNDER STUDY. 1, 2, 3, N, NUMBERS OF TORCH REGIONS). FIG. 3. DISTRIBUTION OF PARTICLES BY SIZES FOR VARIOUS TORCH REGIONS IN LINEAR (SIGMA, 2) AND NORMAL LOGARITHMIC SCALE (A, B) (ERFIE), KRAMP FUNCTION OF D). FIG. 4. PULSE PHOTOGRAPH OF TORCH. FIG. 5. MEDIAN DIAMETER BARDMUM OF PARTICLES IN DIFFERENT TORCH REGIONS (N, NUMBER OF REGION). SUMMARY THE RESULTS OF INVESTIGATION OF SIZE DISTRIBUTION OF PARTICLES SUSPENDED IN DIFFERENT POINTS OF AXI SYMMETRIC SPRAYER FLAME ARE CITED. THE DISTRIBUTION OF PARTICLES BY SIZES IS NORMALLY LOGARITHMIC. DISTRIBUTION OF MASS FLOW RATE OF PARTICLES IS ANALYZED IN VARIOUS REGIONS.

UNCLASSIFIED

USSR

UDC 621.789-977:669.14.018.29

BERNSHTEYN, M. L., PETSOV, G. G., and PISHCHULIN, N. I., Moscow Institute of Steel and Alloys

"Forming the Structure of Structural Steels by High-Temperature Thermomechanical Treatment"

Moscow, Metallovedeniye, No 6, 1971, pp 55-57

Abstract: The structure and mechanical properties of 40Kh, 40KhN, and 40KhNM structural steels were investigated after high-temperature thermomechanical treatment (HTMT) under conditions of pressing at various deformation rates. Specimens of pressed bars were subjected to tensile tests, and their microstructures, particularly the change of their graining character, were investigated at distances of 0.5, 1.5, 2.5, 4.5, and 7.5 mm from the surface. The optimum deformation degree under investigated HTMT conditions was found to be 70%. In this case, recrystallization processes had not yet been developed substantially. It is expedient to anneal structural steels with molybdenum and chromium by HTMT with pressing, which makes it possible to retain the structure developed by hot plastic deformation even in the event of great reduction. Five figures, six bibliographic references.

1/1

USSR

UDC 621.357.8:669.35'5

VALEYEV, A. SH., GRECHUKHINA, T. I., PETROV, G. I.

"Efficient Method of Electrochemical Grinding of Copper and Brass"

V sb. Novoye v elektrofiz. i elektrokhim. obrabotke materialov (What's New in Electrophysical and Electrochemical Treatment of Materials -- collection of works), Leningrad, Mashinostroyeniye Press, 1972, pp 60-62 (from RZh-Khimiya, No 12, Jun 72, Abstract No 12L309)

Translation: A method was developed for electrochemical grinding which permits smoothing of the microrelief of the surface formed as a result of machining by a cutting tool, coarse emery or sand with comparatively small removal of metal. The relief 20 μ high on copper is smoothed by removing ~60 μ of metal. The same relief on brass is smoothed by removing 100 μ of metal. With the corresponding removal of metal it is possible to smooth relief up to 40 μ high and more. The method is based on anode solution in agitated diluted solutions of H_2SO_4 (100-150 g/liter) with $CuSO_4$ additives (100-150 g/liter) under the conditions of the formation of a film with high resistance on the metal surface. The electrolyte temperature is room temperature, D_a is 40-50 amps/dm², the voltage on the electrolyzer terminals is 15-18 volts, and the machine time, 10 minutes.

1/1

USSR

UDC 621.762.001.669.541.45

PASHCHENKO, I. S., PETROV, G. I., KRAPUKHIN, V. V., SHIGINA, L. N.,
MINAKOV, A. T., and GALKIN, P. N.

"Study of Certain Properties of GeO_2 and Powdered Germanium"

Kremniy i germaniy [Silicon and Germanium -- collection of works], No. 2,
Moscow, Metallurgiya Press, 1970, pp. 67-70, (Translated from Referativnyy
Zhurnal-Metallurgiya, No. 1, 1971, Abstract No. 1 G429 by the authors).

Translation: The properties of GeO_2 produced by various methods of hydrolysis
of GeCl_4 are studied. The influence of particle size of GeO_2 and powdered
Ge on changes in bulk mass, pycnometric density, gas permeability,
specific surface, and friability is demonstrated. 4 tables; 6 biblio. refs.

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USSR

UDC 621.791.011:620.192.4:669.295.017

VOLOGDINA, G. P., Candidate of Technical Sciences, and PETROV, G. L., Doctor of Technical Sciences

"Causes of Crack Formation During Welding of Cast Alpha-Titanium Alloys"

Moscow, Svarochnoye Proizvodstvo, No 9, 1973, pp 23-25

Abstract: A study was made to determine the mechanism and cause of crack formation in the heat-affected zone of welded cast alpha-titanium alloys (Ti-Al system). It was found that hot cracks are formed and the reasons for this are the presence of chemical heterogeneity in the initial cast metal, produced by the steady-state method of pouring into a magnesite mold, which leads to the formation of easily melting eutectics of the Ti+TiFe and Ti+Ti₅Si₃ type. The degree of tendency to crack formation depends on the size of segregation concentrations and can be decreased by means of using a pouring technology which provides a fast rate of cooling, high density of the cast metal, small grain size, and a fine intergranular structure. Development of cracks above 1000°C occurs at a stress equal to 0.3 of the yield point. Presence of chemical heterogeneity in the initial cast metal causes a heterogeneity in the plastic deformation of heat-affected zone microvolumes during welding which leads to the formation of cracks at a temperature below 900°C. 4 figures, 1 table, 8 bibliographic references.

1/1

USSR

USHAKOV, V. B., PETROV, G. M., KAZENNOV, G. G.

"Prospects for Development of Third Generation Analog Computer Equipment"

Analogovaya i Analogo-Tsifr. Vychisl. Tekhn. [Analog and Analog-Digital Computer Equipment -- Collection of Works], No 5, Moscow, Sov. Radio Press, 1973, pp 3-19 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V640, by the authors).

Translation: A study is made of the characteristic features of third generation analog computers, related to changes in the technological base and the introduction of linear integrated circuits, as well as the use of a new principle of construction of these structural plans of systems, machines and computer units. The most important problems involved in the development of the software for future machines are indicated. 19 biblio. refs.

1/1

USSR

UDC 621.396.6-181.48

MAKSIMENKOV, A. V. and PETROV, G. N.

"Algorithm of Deformation Associated With the Disposition of Cells for Standard BIS (Large Integrated Circuits)"

Sb. nauch. tr. po probl. mikroelektron. tekhn. (Collected Scientific Works on Problems of Microelectronics Technology), 1972, vyp.10, pp 40-48 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 V227)

Translation: A deformation algorithm is studied associated with the disposition of the cells of a standard, large integrated circuit on a real plate which takes into consideration its suitability chart. This is done with the aim of the machine design of standard, large integrated circuits with selective intercoupling. Resume.

1/1

USSR

UDC: 621.31.043:006.12

2

KOSTENKO, M. P., KOSTENKO, M. V., NEYMAN, L. R., PETROV, G. N., POPKOV, V. I.,
SLONIM, M. A., Leningrad, Moscow

"Goals of the Scientific Council of the Academy of Sciences of the USSR on
Theoretical and Electrophysical Problems of Electric Power Engineering, and
the Work of the Council in 1969-1970"

Moscow, Izvestiya Akademii Nauk SSSR, Energetika i Transport, No 2, Mar/Apr 71,
pp 28-38

Abstract: The goals of the Council and its activities for the years 1969-1970
are explained by the chairmen of the five sections of the Council: Academician
M. P. Kostenko, chairman of the first section on theoretical problems of genera-
tion of electromagnetic energy, Corresponding Member of the Academy of Sciences
of the USSR G. N. Petrov, chairman of the second section on problems of electro-
magnetic field theory in electric power and electrophysical devices, Academician
L. R. Neyman, chairman of the third section on problems in the theory of non-
linear electric circuits of complex electric power and electromechanical de-
vices, Corresponding Member of the Academy of Sciences of the USSR M. V. Kos-
tenko, chairman of the fourth section on theoretical problems of electrophy-
sically high voltages, and Academician V. I. Popkov, chairman of the fifth

1/2

USSR

KOSTENKO, M. P., et al, Izvestiya Akademii Nauk SSSR, Energetika i Transport, No 2, Mar/Apr 71, pp 28-38

section on electrophysical processes in gases under high pressure, and scientific problems associated with creating transfers and equipment with insulation by compressed gases. A historical review is given of the aims of each section, its future goals are outlined, and the work done by each section in 1969-1970 is outlined together with plans for 1971.

2/2

- 158 -

USSR

PETROV, G. N.

"Analysis of Projection Images of Integrated Microcircuits"

Sb. Nauch. tr. po Probl. Mikroelektron. Mosk. In-t Elektron. Tekhn. [Collected Scientific Works on Problems of Microelectronics, Moscow Institute of Electronic Engineers], No 6, 1971, pp 217-221, (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V703 by V. Mikheyev).

Translation: The general topology of transistors is studied and the following formula is suggested for analysis of the quality of graphic images of integrated microcircuits:

$$K = \frac{1}{\sum_{i=1}^n K_i M_i} = \frac{1}{K_1 M_1 + K_2 M_2 + K_3 M_3 + K_4 M_4 + K_5 M_5 + \dots + K_n M_n}$$

where K is the image quality indicator; n is the number of properties characterizing quality; K_i is a dimensionless indicator of the absolute value of $1/2$

USSR

PETROV, G. N., Sb. Nauch. tr. po Probl. Mikroelektron. Mosk. In-t Elektron. Tekhn., No 6, 1971, pp 217-221.

each i th property (in comparison with a standard); M_i is the relative weight of each i th property, such that

$$0 < M_i < 1 \text{ и } \sum_{i=1}^n M_i = 1;$$

K_t is the coefficient of drawing time; K_1 is the number of sheets on the drawing; K_s is the shaded area of the drawing; K_{ty} is the area of the drawing devoted to technical conditions; K_{k3} is the relative number of characters on the drawing. The relative weight means the frequency of appearance of any given characteristic, the percent content of each graphic property in the drawing. It is noted that this analysis allows such problems to be solved as the achievement of unity in technical documentations; the performance of measures for simplification of images; determination of the degree of mechanization and automation of graphic and drawing operations.

2/2

USSR

UDC: 518.5:681.3.06

MIKHAYLOV, A. V. PETROV, G. N.

"Relative Location of Two Geometric Figures in Design of Integrated Circuits"

Sb. nauch. tr. po probl. mikroelektron. Mosk. in-t elektron. tekhn. (Collected Scientific Works on Problems of Microelectronics. Moscow Institute of Electronics Technology), 1971, vyp. 6, pp 213-216 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V975)

Translation: The authors consider an algorithm and a program for solving the problem of relative location of two flat geometric figures at a given distance from each other.

1/1

1/2 016 UNCLASSIFIED
TITLE--COMPOSITION FOR HERMETIZATION -U-

PROCESSING DATE--30OCT70

AUTHOR--(05)-ERLIKH, I.M., GITINA, I.G., PETROV, G.N., RAPPOPORT, L.YA.,
VASILYEVA, I.N.
COUNTRY OF INFO--USSR

SOURCE--USSR 265,344
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRATSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED--09MAR70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--HERMETIC SEAL, POLYGLYCOL, PLASTICIZER, ORGANIC ISOCYANATE,
PATENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3002/1459

STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0128858

UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AA0128858

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE COMPN., WITH ENHANCED

MECH. STABILITY, ELASTICITY, AND ADHESION, IS BASED ON UNSATD.

POLYGLYCOLS OF REGULAR STRUCTURE AND CONTAINS A PLASTICIZER,

POLYISOCYANATES, AND AN ACTIVATING SYSTEM.

FACILITY: KALININ, M.

I., POLYTECHNIC INSTITUTE, LENINGRAD.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--A COMPOSITION FOR PROVIDING A FOUNDATION FOR ELECTROVACUUM ARTICLES
-U-
AUTHOR--(04)-MASLOV, N.I., PETROV, G.N., RAPPOPORT, L.YA., KOGAN, F.S.
COUNTRY OF INFO--USSR
SOURCE--USSR 264,960
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED--03MAR70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ELECTROVACUUM, PATENT, ADHESION, BUTADIENE, ISOPRENE, ORGANIC
ISOCYANATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3002/1456

STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0128855

UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AA0128855

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. A COMPN. FOR INCREASING THE ADHERENCE OF ELECTROVACUUM ARTICLES, E. G., ELEC. LAMPS, TO THEIR FOUNDATION IN CONDITIONS OF INCREASED MOISTURE HAS THE FOLLOWING RELATION OF COMPONENTS (IN WT. PARTS). DIVINYL POLYMER WITH ISOPRENE 10-11, TOLYLENE DIISUCYANATE 1-1.1, EPICHLOROHYDRIN 0.29-0.31, DIMETHYLBENZYLAMINE 0.21-0.23, AND POWD. MARBLE 28-36.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--STYRENE COPOLYMERS -U-
AUTHOR--(05)-PETROV, G.N., RAPPOPORT, L.YA., SAVINSKIY, P.A., MONAKHOVA,
L.A., MOLOTKOV, R.V.
COUNTRY OF INFO--USSR
SOURCE--U.S.S.R. 263,877
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED--10FEB70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--STYRENE, COPOLYMER, POLYMER CROSSLINKING, ACRYLATE, ETHYL
CARBAMATE, CHEMICAL PATENT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1995/1082 STEP NO--UR/0482/70/000/000/0000/0000
CIRC ACCESSION NO--AA0116548
UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--16OCT70
CIRC ACCESSION NO--AA0116548
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE COPOLYMERS ARE PREPD. BY
COPOLYMG. STYRENE WITH A CROSSLINKING AGENT (POLYDIENE URETHANE
DIACRYLATE) IN THE PRESENCE OF A HARDENER.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--STABILITY OF POLYURETHANES -U-
AUTHOR--(05)-ANTIPOVA, V.F., MELAMED, V.I., PETROV, G.N., RAPPOPORT, L.YA.,
KOGAN, F.S.
COUNTRY OF INFO--USSR
SOURCE--PLAST. MASSY 1970, (2), 49-50
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS, CHEMISTRY
TOPIC TAGS--POLYURETHANE RESIN, CHEMICAL STABILITY, QUARTERNARY AMMONIUM
SALT, TRIETHYLAMINE, EPICHLORHYDRIN
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1977/0674 STEP NO--UR/0191/70/000/002/0049/0050
CIRC ACCESSION NO--AP0119582
UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119582

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTS OF DONOR ACCEPTOR ADDITIVES, E.G., N,N,DIMETHYLBENZYLAMINE (I) AND PHENYL GLYCIDYL ETHER (II), I AND GLYCIDOL, I AND EPICHLOROHYDRIN (III), AND II AND ET SUB3 N, ON THE AGING RESISTANCE OF CROSSLINKED POLYURETHANES (IV) WERE STUDIED. THE STABILITY OF IV WAS INVERSELY PROPORTIONAL TO THE TOTAL ADDITIVE CONTENT, REACHING A MIN. WHEN BOTH COMPONENTS WERE PRESENT IN AN EQUIMOLAR RATIO. THE STABILITY OF IV INCREASED WHEN III WAS USED, PRESUMABLY DUE TO THE FORMATION OF A STABLE QUATERNARY AMMONIUM COMPO.

UNCLASSIFIED

AAC043508

Petrov, G.N.

UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent,

226155 STEREO-REGULAR POLYMERS are prepared by the polymerisation of di-olefins using a bi-functional polymeric radical catalyst having organo-metalgroups at both ends, the metal combinations being gp. I and II, or I and III, or II, or III. The previous method utilised as catalyst transition metals and alkyls and alkyl-halides of aluminium which were very unstable in the atmosphere. In an example, 370 ml hexane, 95 ml iso-prene, 0.75 g complex bi-functional organo-metal (NaAlR_2), $(\text{C}_2\text{H}_5)_2$, and 0.6 ml TiCl_4 are polymerised for 38 hrs. in an autoclave at 20°C . The polymer is precipitated with ethanol to give 67% yield (mol. wt 320,000) of which 90% is cis-1,4-polymer. 2.11.64. as 927914/23-5, PETROV, G. N. et al. S.V. Lebedev Synthetic Rubber Res. Inst. (22.8.69) Bul. 28/5.9.68. Class 39c; Int. Cl. C 08d.

19761906

AA0043508

Petrov, G. N.; Lisochkin, G. F.; Shmagin, V. P.; Shibanova, O. M.

Vsesoyuznyy Nauchno-Issledovatel'skiy, Institut Sinteticheskogo Kauchuka
imeni Akad. S. V. Lebedeva.

3/2
19761907

ZIL'BERMAN, I.I., PETROV, G.S.
"Transfer Of Energy From An Electron Flow To A High-Frequency Field Of A Two-Gap
Gridless Resonator With Antiphased Voltage At The Gaps"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronics Technology.
Scientific-Technical Collection. Microwave Electronics), 1970, No 3, pp 65-75
(from RZh--Elektronika i yeye primeneniye, No 8, August 1970, Abstract No 8A18)

UDC 621.
Translation: In a kinematic approximation, a computation is performed for the transfer of energy from a bunched electron flow to a 2-gap gridless resonator. The computation is performed for three annular domains; at the axis of the gap $r = 0$, at the edge of the gap with $r = a$, and the center part with $r = a/2$. It is shown that for small distances between the gaps, the conditions for optimum transfer of energy for these three domains differ substantially. The dependence of the electronic efficiency of the resonator on the geometry of the interaction domain is considered, and recommendations are given with respect to a choice of optimum relationships.

1/1

USSR

UDC: 621.362.2

PETROV, G. S., TAYTS, D. A., CHERNYAVSKIY, V. V., Special Design Office of
Semiconductor Devices

"A Method of Thermostabilization"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzsy, Tovarnyye Znaki,
No 11, Apr 72, Author's Certificate No 333645, Division G, H, filed 1 Apr
70, published 21 Mar 72, p 213

Translation: This Author's Certificate introduces a method of thermosta-
bilization of an object by means of a thermopile located inside a solid
and having a nonstationary heat source. As a distinguishing feature of
the patent, in order to maintain the temperature of the heat-sensitive
section constant, a thermal wave is generated which is directed toward the
heat-sensing section in such a manner that the thermal wave arrives in the
heat-controlled area in antiphase with respect to the heat wave of the non-
stationary source.

1/1

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USSR

UDC: 621.396.6-181.5

AGAKHANYAN, T. M., VASIL'YEV, A. S., GALITSKIY, V. V., DONCHUK, S. D.,
PETROV, G. V., SMOLKO, G. G.

"Hybrid Circuits Utilizing Thin-Film Distributed RC Structures"

V sb. Mikroelektronika. Vyp. 1 (Microelectronics. No 1--collection of
works), Moscow, Atomizdat, 1971, pp 31-62 (from RZh-Radiotekhnika, No 6,
Jun 71, Abstract No 6V165)

Translation: Results found in development of microelectronic circuits
utilizing thin-film distributed RC structures are taken as a basis for
analysis of the possibilities of constructing a number of amplifiers,
sine-wave generators and relaxation circuits in the form of hybrid micro-
circuits. A number of recommendations are given on making microcircuits.
Thirty-seven illustrations, bibliography of thirty-six titles. N. S.

1/1

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USSR

UDC: 621.373.531.1(088.8)

PETROV, G. V., Moscow Chemical Engineering Institute

"A Stabilized Transistorized Multivibrator"

USSR Author's Certificate No 262156, filed 8 Jul 68, published 3 Jun 70
(from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2G259 P)

Translation: This Author's Certificate introduces a stabilized transistorized multivibrator which contains time-mark circuits and resistors made up of three-layer distributed RC structures with metallic and resistive inside layers, a selective amplifier which performs the function of an impact excitation circuit and is based on two transistors and RC structures with additional sources of supply and bias. To improve the frequency stability of the pulses generated, the collectors of the transistors in the selective amplifier are connected to the inside resistive layers of the RC structure, the bases are grounded, and the emitters are connected to the inner metallic layers of the RC structure through resonance resistors and also connected through limiting resistors to one terminal of the bias source.

1/1

USSR

KOSTETSKIY, B. I., SAGACH, M. F., LAVRUK, V. I., and PETROV, I. F., UDC 531.43.
Kiev

"Contactless (Thermovisual) Method of Measuring the Temperature
on a Sliding Contact at External Friction"
Moscow, Mashinovedeniye, No 4, Jul-Aug 73, pp 116-119

Abstract: The method and the installation for the contactless
(thermovisual) measuring of actual temperatures (from 10-2000°C),
originating on friction surfaces, are described. The results of
experimental works in measuring temperatures of different pairs
of metals under conditions of dry and boundary friction are re-
ported. The dependence of the temperature change of the friction
surface on the duration of the experiment and the influence of
various lubrication media on the temperature of friction surfaces
are discussed by reference to diagrams. The advantages of the
thermovisual method, in comparison with other known methods, are
indicated. Operation characteristics of the thermovisual instal-
lation and of a thermopair (Chromel-Copel) with galvanometer are
presented. Six figures, one table, five bibliographic references.

1/1

1/2 014 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--DETERMINATION OF THE CRYSTAL STRUCTURE OF GE SUB3 BI SUB2 TE SUB6
-U-
AUTHOR--PETROV, I.I., IMANOV, R.M.
COUNTRY OF INFO--USSR
SOURCE--KRISTALLOGRAFIYA 1970, 15(1) 168-70
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--CRYSTAL STRUCTURE, TELLURIDE, GERMANIUM COMPOUND, BISMUTH
COMPOUND
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1986/0016 STEP NO--UR/0070/70/015/001/0168/0170
CIRC ACCESSION NO--AP0102116
UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0102116

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE STRUCTURE OF GE SUB3 BI SUB2 TE SUB6 WAS STUDIED BY ELECTRON DIFFRACTION. THE D. OF GE SUB3 BI SUB2 TE SUB6 IS 7.15 G-CM PRIME3. THE INTERAT. DISTANCES IN GE SUB3 BI SUB2 TE SUB6 ARE GE-TE 3.00-3.01, BI-TE 3.01-3.02, AND TE-TE 3.52 AND 4.21 ANGSTROM. A MODEL OF THE GE SUB3 BI SUB2 TE SUB6 STRUCTURE DERIVED FROM THE EXPTL. DATA IS GIVEN. THE STRUCTURE IS LAMINAR WITH THE ELEMENTARY UNIT CONSISTING OF AN 18 LAYER RHOMBOHEDRAL PACKING OF TE ATOMS WITH THE GE AND BI ATOMS OCCUPYING FIVE SIXTHS OF THE OCTAHEORAL VOIDS.

UNCLASSIFIED

0123

1/2 029 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--S TYPE NEGATIVE RESISTANCE IN FILM ELEMENTS BASED ON LXYGEN FREE
COMPOUNDS SPRAY COATED BY AN EXPLOSIVE METHOD -U-
AUTHOR-(03)-ORESHKIN, P.T., BARYSHEV, V.G., PETROV, I.M. P
COUNTRY OF INFO--USSR
SOURCE--IZV. VYSSH. UCHEB. ZAVED., FIZ. 1970, 13(2), 123-5
DATE PUBLISHED-----70
SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.
TOPIC TAGS--EXPLOSIVE BONDING, SEMICONDUCTING FILM, CHALCOGENIDE GLASS,
VOLT AMPERE CHARACTERISTIC
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1993/0486 STEP NO--UR/0139/70/013/002/0123/0125
CIRC ACCESSION NO--ATJ113377
UNCLASSIFIED

2/2 029

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AT0113377

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE VARIATIONS WERE STUDIED FOR THE TECHNOLOGY OF PREPG. SWITCHES WITH S TYPE NEG. RESISTANCE. THE ELEMENTS WERE PREPD. BY USING THE "EXPLOSIVE" SPUTTERING OF O FREE COMPS. (CHALCOGENIDE GLASS CONTG. TE 47.7, AS 29.9, SI 12.64, AND GE 9.76PERCENT) OR A MECH. MIXT. OF GE AND SE. THE FILM THICKNESS WAS 4-7 MU AND THE V-A CHARACTERISTICS WERE STUDIED. THE USE OF MECH. MIXTS. IS OF INTEREST AS IT AVOIDS THE SYNTHESIS OF THE GLASS. FACILITY: RYAZAN. RADIOTEKH. INST., RYAZAN, USSR.

UNCLASSIFIED

USSR

UDC: 62-752.4

PETROV, I. N.

"On Effect of Interframe Correction on Drift of Gyroscope Integrator of Linear Accelerations With Oscillations of the Base"

Tr. Kazan. aviats. in-ta (Transactions of Kazan Aviation Institute) 1971, vyp 138, pp 51-57 (from Referativnyy Zhurnal-Raketostroyeniye, No 7, 1972, Abstract No 7.41.167)

Translation: A gyroscopic integrator of linear accelerations mounted on a swinging base is investigated. Friction forces on the suspension axes and mass of the frames are assumed to be negligible. The angular velocity of systematic drift of the gyrointegrator is determined for the case of relay and proportional correction providing the perpendicularity of the suspension frames (4 references, resume).

1/1

USSR

UDC 669.14.018.48.004.12:669.
018.262

YAKUSHIN, V. I., CHIZHOVA, V. YA., RAKEVICH, S. Z., and PETROV,

I. N.

"Quality of Non-Aging Type 08Yu Steel Produced in a Dual-Bath Steelmaking Furnace"

Proizvodstvo Chernykh Metallov [Production of Ferrous Metals--Collection of Works], No 75, Metallurgiya Press, 1970, pp 74-77

Translation: The possibility is demonstrated of producing low-carbon non-aging type-08Yu steel in a dual-bath steelmaking furnace. The technology differs significantly from the ordinary open-hearth process.

It is characterized by high rates of oxidation during the finishing period, from 0.60 to 1.35%/hr (averaging about 1.00%/hr). Due to the rapid nature of the process, the period of pure bubbling is absent in the production of non-aging steel.

One distinguishing feature of melts in the dual-bath furnace is the increased degree of oxidation of the final slag.

The yield of rollable steel and the quality of end products are practically the same as for steel of the same type produced in open-hearth furnaces without blowing of oxygen through the bath.

1/1

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USSR

UDC 62.752.4

PETROV, I. N., Tyumen' Industrial Institute

"Concerning the Effect of High Frequency Vibrations on the Linear Acceleration Gyroscope Integrator"

Leningrad, Izvestiya Vysshikh Uchebnykh Zavedeniy, Priborostroyeniye, Vol 14, No 9, 1971, pp 98-103

Abstract: The motion of a gyroscope integrator of linear accelerations, mounted on a support subjected to lunar high frequency vibrations is studied, under the assumption of apparatus absolute rigidity, and that the system of interframe correction have an ideal relay characteristic. The method of averaging is applied here to the solution of equations of motion of a gyroscope integrator, established in the form of Lagrange equations of the second order. Expressions are derived for determining the self-oscillations parameters and the integrator supplementary drift along the axis of the outer frame. The obtained formulas make it possible to determine the integrator inaccuracies under certain conditions, and the field of its application.

1/1

USSR

UDC 669.14.018.48.004.12:669.
018.262

YAKUSHIN, V. I., CHIZHOVA, V. YA., RAKEVICH, S. Z., and PETROV,
I. N.

"Quality of Non-Aging Type 08Yu Steel Produced in a Dual-Bath Steelmaking Furnace"

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type-08Yu steel in a dual-bath steelmaking furnace. The technology differs sig-
nificantly from the ordinary open-hearth process.

It is characterized by high rates of oxidation during the finishing period,
from 0.60 to 1.35%/hr (averaging about 1.00%/hr). Due to the rapid nature of the
process, the period of pure bubbling is absent in the production of non-aging
steel.

One distinguishing feature of melts in the dual-bath furnace is the increased
degree of oxidation of the final slag.

The yield of rollable steel and the quality of end products are practically
the same as for steel of the same type produced in open-hearth furnaces without
blowing of oxygen through the bath.

1/1

USSR

PETROV, I. N.

"Drift of Gyroscopic Linear-Acceleration Integrator Mounted on Vibrating Base"

Tr. Kazan. aviats. in-ta (Works of Kazan' Aviation Institute), 1970, vyp. 121, pp 42-50 (from PZh-Mekhanika, No 1, Jan 71, Abstract No 1A83 by A. G. Burgvits)

Translation: It is assumed that amplitudes of oscillations of the base are small, and friction in the suspension axes is disregarded. Equations of motion of the instrument are solved by the method of successive approximations. It is shown that oscillations of the base with frequency close to the frequency of nutational oscillations of the integrator can induce significant errors in the instrument readings. An example of the calculation is given.

1/1

USSR

UDC 62-752.4

PETROV, I. N., Tyumen' Industrial Institute

"Concerning the Dynamics of a Gyroscopic Linear-Acceleration Integrator;
Set Up in a Vibrating Base"
Leningrad, Priborostroyeniye, No 1, 1971, pp 79-84

Abstract: An investigation is made of the motion of a linear-acceleration gyro integrator that is set up on a base which makes angular high-frequency vibrations. The self-oscillation parameters and the drifts of the instrument are found by the method of averaging. One figure, 4 bibliographic entries.

1/1

84 -

1/2 014 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--PRIME12 C (PRIME3 HE, PRIME3 HE PRIME) PRIME12 C AND PRIME12 C (PRIME
3 HE.T) PRIME12 N MIRROR REACTIONS -U-
AUTHOR-(05)-ARTEMOV, K.P., GLUKHOV, YU.A., GOLDBERG, V.Z., DAVYDOV, V.V.,
PETROV, I.P.
COUNTRY OF INFO--USSR
SOURCE--YAD. FIZ. 1970, 11(1), 43-7
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--ION BOMBARDMENT, CARBON ISOTOPE, NUCLEAR REACTION, EXCITED
NUCLEUS, DIFFERENTIAL CROSS SECTION, HELIUM ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1980/0171

STEP NO--UR/0367/70/011/001/0043/0047

CIRC ACCESSION NO--AP0048463

UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--09OCT70
 CIRC ACCESSION NO--AP0048463
 ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DIFFERENTIAL CROSS SECTIONS ARE MEASURED FOR THE TITLE MIRROR REACTIONS AT AN PRIME3 HE ION ENERGY OF 36 MEV. DIRECT EVIDENCE IS PRESENTED THAT THE STATES OF THE PRIME12 C NUCLEUS WITH ENERGIES 15.1 MEV (1 PLUS, T) EQUALS 1) AND 16.1 MEV (2 PLUS, T EQUALS 1) ARE ANALOGOUS TO THE GROUND STATE (1 PLUS) AND THE 1ST EXCITED STATE (0.95 MEV) OF PRIME12 N. THUS, THE 0.95-MEV LEVEL OF PRIME12 N HAS THE QUANTUM NOS. 2 PLUS. THE ADMIXT. OF THE T EQUALS 0 STATE TO THE 15.1-MEV STATE OF PRIME12 C IS NO MORE THAN 3PERCENT IN THE AMPLITUDE. THE SAME ADMIXT. TO THE 16.1-MEV STATE OF PRIME12 C IS ALSO, VERY LIKELY NO MORE THAN A FEW PER CENT FACILITY: INST. AT. ENERGY, IM. KURCHATOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC: 681.3:519.2

PETROV, I. Ye., BYCHKOV, N. P., SABAYEV, L. V., CHEKIN, S. G., PAVLENKO, B. V., ZHARKIKH, V. V.

"A Device for Digital Processing of Radio Signals"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 25, Soviet Patent No 278228, class 42, filed 6 Jan 69, published 5 Aug 70, pp 134-135

Translation: This Author's Certificate introduces a device for digital processing of radio signals which contains an analog-to-code converter and an arithmetic device. As a distinguishing feature of the patent, the device is designed for realizing the operation of digital detection. For this purpose the unit contains digital weight coefficient generators; and the arithmetic unit contains a multiplier, squarer, adder, and a device for extracting the square root. The output of the analog-to-code converter and the outputs of the digital weight coefficient generators are connected to the inputs of the multiplier. The multiplier output is connected to an accumulator, which is connected, in turn, through the squarer to the adder input. The outputs of the adder are connected to the device for extracting the square root.

1/1

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USSR

UDC 547.341.07

PETROV, K. A., PARSHINA, V. A., YEROKHINA, T. S., and PETROVA, G. M.

"A Method of Producing Hydroxymethyl-bis-(dialkylaminomethylene) Phosphine Oxides"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obrazttsy, Tovarnyye Znaki, No 16, Jun 73, Author's Certificate No 375300, Division C, filed 9 Aug 71, published 23 Mar 73, p 52

Translation: This Author's Certificate introduces: 1. A method of producing hydroxymethyl-bis-(dialkylaminomethylene) phosphine oxides. As a distinguishing feature of the patent, trioxymethyl phosphine oxide is reacted with a lower dialkylamine ($C \leq 4$) in the presence of heating with subsequent isolation of the goal product by conventional methods. 2. A modification of this method distinguished by the fact that heating is done to 100-140°C in a sealed tube.

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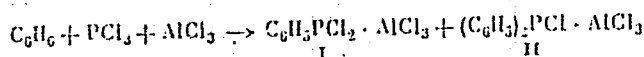
UDC 547.558.1

PETROV, K. A., and LEVIN, G. YA.

"Alkyldiaryl Phosphinates"

Leningrad, Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, pp 37-41

Abstract: A convenient procedure is proposed for obtaining alkyldiaryl phosphinates with like and different aryl radicals. The procedure is based on the interaction of aromatic hydrocarbons with phosphorus trichloride in the presence of aluminum chloride which with a mole ratio of the first two reagents of 1:n where $n \geq 1$, is used primarily to obtain aryldiachlorophosphine. It was shown previously that with a different ratio of the reagents, that is, when $n < 1$, the complex (II) is formed, and when $n > 1$, the complexes (I) and (II) are formed [G. Kosolapoff, et al., J. Am. Chem. Soc., No 69, 202, 1947; N. Nochira, et al., J. Synth. Org. Chem. Japan, No 28, 969, 1970]



The complexes (II) (when $n < 1$) was not used to obtain the alkyldiaryl phosphinates; on treating with water, diphenyl phosphonous acid was isolated, and on treating with alcohol, alkyldiaryl phosphinite. In the paper, as a

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PETROV, K. A., and LEVIN, G. YA., Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, pp 37-41

result of studying the dependence of the yields of the complexes (I) and (II) on the mole ratio of benzene and phosphorus trichloride ($1:n$ where n is $1/3-1/10$) and the reaction time, the optimal conditions of formation of the diaryl derivative of (II) were found.

The methods of synthesizing the alkyl-diaryl phosphinates proposed in this paper differ advantageously from the present ones in that they permit various target products to be obtained with high yields in one stage from highly available substances.

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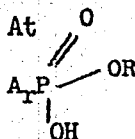
PETROV, K. A. and LEGIN, G. YA.

"Preparation of the Monoesters of Arylphosphonic Acids"

Leningrad, Zhurnal Prikladnoy Khimii, Vol 46, Vyp 2, 1973, pp 408-410

Abstract: The title compounds were prepared by oxidizing the monoesters of arylphosphonous acids with chlorine:

Four other compounds of the general type



were prepared. The

influence of the duration of reaction on the yield of the desired monoether was determined. Preparation, physical constants, and structure conformation are given for the investigated compounds.

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PETROV, K. A., TRESHCHALINA, L. V., and SULAYMANOV, A.

"Synthesis of the Derivatives of β -Alkoxyvinylphosphonic Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 4, Apr 73, pp 753-758

Abstract: Reaction of the anhydride of β -ethoxyvinylphosphonic acid with hexylamine and p-toluidine yields amide salts of β -ethoxyvinylphosphonic acids; in case of aromatic amines the phosphorylation occurs through the stage of the formation of amide salt of β -ethoxyvinylpyrophosphonic acid. A synthetic method has been developed for the synthesis of acid phenyl esters of β -alkoxyvinylphosphonic acid by reacting phenol with the anhydrides of these acids. It has been established that during the reaction of anhydrides with substituted phenols occasionally monoesters of β -alkoxyvinylpyrophosphonic acid are formed instead of monoarylphosphonates. Phenolysis of β -ethoxyvinylphosphonic acid dichlorides with the reagent ratio 1:1 leads to the formation of aryl ether chloroanhydrides which upon reacting with amines yield ether amides.

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UDC 542.951.4

PETROV, K. A., LEGIN, G. Ya., and TSAREVA, A. Kh.

"Synthesis of Arylphosphonous Acid Monoesters"

Leningrad, Zhurnal Prikladnoy Khimii, Vol 46, No 1, Jan 73, pp 152-155

Abstract: Synthesis of phenylphosphonous acid monoesters was carried out by reacting alcohols or their salts with phenylchlorophosphine and transesterification of the lower monoesters of phenylphosphonous acid. The reaction of alcohols with complexes of aryldichlorophosphines and aluminum chloride also yields the title compounds. The reaction was carried out at -10 to -15°; the products were obtained in 83-100% yields. The structures of all products were checked out by IR spectroscopical analysis.

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UDC 542.91+661.718.1

PETROV, K. A., KHORKHOYANU, L. V., BEYSHEKEYEV, Zh., and DZHUNDUBAYEV, K.

"Phosphorus-containing Phenothiazine Derivatives"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 1, Jan 71, pp 110-114

Abstract: In searching for physiologically active substances the authors synthesized previously unknown phosphates, phosphonates and thiophosphonates of phenothiazine derivatives with residues of phosphorus acids bonded to the nitrogen atom of the phenothiazine nucleus by a hydrocarbon chain. [β -(Phenothiazinyl-10) isopropyl] phosphates were obtained by the reaction of chlorophosphates with 10-(β -hydroxypropyl)phenothiazine. Bis[β -(phenothiazinyl-10)isopropyl] methylphosphonate was obtained from methylphosphonic acid dichloride and 10-(β -hydroxypropyl)phenothiazine. [β -(Phenothiazinyl-10)isopropyl] diethylthiophosphinate was obtained from the diethylamide of diethylphosphinous acid and 10-(β -hydroxypropyl)phenothiazine with subsequent addition of sulfur to the phosphinite. Sodium phenothiazine reacts with diethyl esters of chloromethyl- and β -chloroethylphosphonic acids to give N-ethylphenothiazine and diethyl [β -(phenothiazinyl-10)ethyl] phosphonate respectively. The oxidation of [β -(phenothiazinyl-10)isopropyl] phosphates was studied.

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UDC 547.341

PETROV, K. A., KHORKHOYANU, L. V., DZHUNDUBAYEV, K., SULAYMANOV, A.

"Synthesis and Properties of β -Alkoxyvinylphosphonic Anhydrides I."

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70,
pp 1968-1970

Abstract: To the dichloroanhydride of β -ethoxyvinylphosphonic acid in anhydrous toluene, water was added dropwise at 20° followed by heating the reaction mixture for 2 hrs at 110° under a stream of nitrogen. The solvent was evaporated and the residue kept 2-3 hrs at 2-3 mm vacuum and 100-110° to yield the anhydride of β -ethoxyvinylphosphonic acid (I), m.p. 75-76°, a thermally stable hygroscopic, brittle material. Another way of obtaining (I) was by adding water to the starting dichloroanhydride kept in anhydrous benzene-pyridine mixture; absolute methanol could be substituted for water. To obtain a monoalkyl ester, (I) dissolved in anhydrous benzene or toluene was refluxed 6-10 hrs with anhydrous alcohol in a dry atmosphere. After removing the solvent, the residue was kept at 90-110°/7-8mm for 2-3 hrs, yielding the product -- dark syrupy 1/2

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PETROV, K. A., et al, Zhurnal Obshchey Khimii, Vol 40, No 9,
Sep 70, pp 1968-1970

liquids. The anhydrides were characterized by conversion to
ammonium and calcium salts.

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UDC 547.234+547.241

PETROV, K. A., PARSHINA, V. A., SHEFER, G.

"Hydrazides of Phosphorus Acids"

Leningrad, Zhurnal Obshchei Khimii, Vol 40, No 6, Jun 70, pp 1234-1236

Abstract: Hydrazine, N,N-dimethylhydrazine, phenylhydrazine, and acetylhydrazine react with the monochlorides of 2-chlorophenyl esters of phosphoric and phosphonic acids as well as their thio analogs. The reaction was run in benzene and at equimolar ratios of the reagents. The corresponding monohydrazide derivatives were formed. The nature of the hydrazine has no effect on the reaction rate. The products obtained are relatively stable compounds with a distinct amine odor, soluble in organic solvents, and insoluble in water. The IR spectra of the products obtained exhibit the absorption bands characteristic for the P=O, P-O-C, P-O-C, P-OC₆H₄Cl, C₆H₅, and P-N groups.

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UDC 547.341.07

PETROV, K. A., KHORKHOYANU, L. V., DZHUNDUBAYEV, K., SULAYMANOV, A., and PRIGORENKO, P. G.

"A Method of Making β -Alkoxyvinylphosphonic Acid Anhydrides"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 27, 1970, Soviet Patent No 279615, Class 12, filed 6 May 69, p 29

Abstract: This Author's Certificate introduces: 1. A method of making β -alkoxyvinylphosphonic acid anhydrides. As a distinguishing feature of the patent, β -alkoxyvinylphosphonic acid dichloride is interacted with water, and conventional methods are used to remove the hydrogen chloride which is released. 2. A modification of this method distinguished by the fact that the process is carried out in an organic solvent such as benzene.

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UDC 547.341

PETROV, K. A., KHORKHOYANU, L. V., DZHUNDUBAYEV, K., SULAYMANOV, A.

"Synthesis and Properties of β -Alkoxyvinyl Phosphonic Anhydrides"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70,
pp 1971-1973

Abstract: A new method for the synthesis of anhydrides of β -alkoxyvinylphosphonic acid (I) is described, consisting of the reaction of equimolar quantities of the dichloroanhydride with the complete ester of β -alkoxyvinylphosphonic acid. The product is a monomer. To obtain β -propoxy- α -methylvinylphosphonic anhydride, (I) in an absolute benzene pyridine mixture is reacted with absolute methanol. The reaction mixture is refluxed for 5 hrs, precipitate separated, filtrate washed with benzene, solvent evaporated, and residual mass kept for 1-1.5 hrs at 80-100/10-15 mm. These anhydrides react with epoxides to yield five membered cyclic esters. The epoxides are added in ice followed by heating the reaction mixture for 6-7 hrs to 70-100°.

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